

XVIII. *An Account of certain perfect minute Crystal Stones, by J. Parsons, M. D. & F. R. S.*

Read June 27. 1745. THE Drawing here annexed, TAB. III.

Fig. 10., represents a small Crystal magnified; it is one of a great Number brought by a very curious Gentleman from *Gibraltar*, who has caused many of them to be set in Buckles of different Kinds, for the Wear of his Lady and himself: And altho' they are formed and polish'd by Nature; yet they look very bright, and produce a very good Effect in the Buckles.

They were found accidentally. This Gentleman saw a Man cleaving a Rock near that Town, and observ'd a great Quantity of fine black Powder fall from its Crevices; and, being very curious, he examined the Powder, and found these little Stones in Clusters, consisting of no more than twelve or fourteen each; and each Cluster lying at considerable Distances from one another. They are all of the same Form, some less perfect than others, and are in general Hexagonals.

XIX. *A Letter from Mr. John Ellicot, F. R. S. to the President, concerning the specific Gravity of Diamonds.*

Read July 4. 1745. AS, from some Experiments I have lately had the Opportunity of making, it appears highly probable, that what has formerly

merly been published concerning the specific Gravity of Diamonds, is not to be depended upon; I hope a short Account of these Experiments will not be unacceptable to you, especially as I do not find the least Notice taken of the specific Gravity of Diamonds in any of the Tables published in the *Philosophical Transactions*.

In the Account the Honourable Mr. *Boyle* has given of Diamonds (as published by Dr. *Shaw*, in his Abridgment of that Gentleman's Philosophical Works *), he relates it "as the Opinion of a famous " and experienced Cutter of Diamonds, that some " rough Diamonds were considerably heavier than " others of the same Bigness, especially if they were " cloudy or foul; and Mr. *Boyle* mentions one that " weigh'd 8 Grains and $\frac{8}{16}$; which, being carefully " weigh'd in Water, according to the Rules of " Hydrostatics, proved to an equal Bulk of that " Liquor, as $2 \frac{2}{3}$ to 1; so that, as far as could " be judged by that Experiment, a Diamond weighs " not thrice so much as Water." And yet, in this Table of specific Gravities, that of a Diamond is said to be to Water as 3400 to 1000, or as 3, 4. to 1; and therefore, according to these two Accounts, there should be some Diamonds, whose specific Gravity shall differ nearly the $\frac{1}{8}$ from others; which I am persuaded, is a much greater Difference than could be expected in any Bodies of the same kind, or that which, on a more nice Examination, will be found to be in Diamonds.

The

* Pag. 83. Vol. V. new Edition of Mr. *Boyle's* Works in folio.

The first Diamonds I had the Opportunity of seeing weigh'd, were two very large ones from the *Brasils*, which were furnished by Mr. *Chace*, a Merchant in *Austinfriers*: The specific Gravities of these were found to be much greater than the heaviest of Mr. *Boyle's*, the one being to an equal Bulk of Water as 3518, and the other as 3521 to 1000, and the Difference between them less than the one-thousandth Part. There were two smaller *Brasil* Diamonds weigh'd at the same time, which indeed were not quite so heavy as the former, the lightest being but as 3501, the other as 3511; but, as these were of the same kind, and comparatively small, I judged this Difference could not be much depended on. Having therefore an Opportunity some time since of a large Parcel of *East-India* Diamonds, I chose out 10, which, both in Shape and Colour, and every other respect, were as different from each other as possible. These being weigh'd in the same Scales and Water as the former, the lightest proved to be as 3512, and the heaviest as 3525; the very near Agreement of these last with each other, and with the former, tho' weigh'd at about eight Months Distance, makes it highly probable, that so great a Difference as appears from the Place above-cited, and Mr. *Boyle's* Table, is not to be found in any Diamonds whatsoever, much less so great a Difference as appears between the lightest of his and the heaviest of mine, being above $\frac{1}{7}$ of the Whole.

I had never made any Experiments myself, by which I could form a Judgment, how much of the Difference between these and former Trials might arise from the different Tempers and Qualities of the

Waters used ; warm Water being lighter than cold, and Pump-Water generally heavier than River-Water. But, taking it for granted, that all Persons who make such Experiments use common and not Mineral Waters, and Waters of the natural Temper, and not heated designedly, I am assured by a Friend, who has made many careful Trials for this particular Purpose (an Account of which he has promised me shall be laid before the *Royal Society*), that the specific Gravity of any Body will not differ above $\frac{1}{1000}$ at the most, on account of the Quality of the Water and Temper taken together ; whereas the heaviest of Mr. *Boyle's* Diamonds, as in his Tables, differs from the lightest of mine by above one Thirty-fifth Part, which is about six times as much as $\frac{1}{1000}$: And yet I can think of no other Way of accounting for the rest of this Difference ; unless it should arise from the Smallness of the Diamonds, or any Defect in the Instruments with which his Experiments were made.

The Scales in which these Diamonds were weigh'd turned very sensibly with the two-hundredth Part of a Grain ; and as one of the Diamonds weighed above 92 Grains, it was capable of being weighed to less than the 18000th Part : several of them were weigh'd twice over both in Water and Air, and the Weights found to agree to the greatest Exactness ; and if to this is added the very near Agreement of the Weights of the several Diamonds, tho' weigh'd at different Times, and at a considerable Distance, from each other, I think it highly improbable, that there could be any considerable Mistake in these Trials ; and therefore

their specific Gravities, as in the following Table, may fully be depended on.

I have set down the Weights of the several Diamonds both in Air and Water, that if any Mistake should have happened, it may be the more easily rectified. I am, Sir, with the greatest Respect,

Your obedient humble Servant,

John Ellicott.

N ^o .	Water	In Air	In Water	Specif. Grav.
		Grains	Grains	1000
1	A <i>Brazil</i> Diamond, fine Water, rough Coat	92,425	66,16	3518
2	A <i>Brazil</i> Diamond, fine Water, rough Coat	88,21	63,16	3521
3	Ditto. fine bright Coat,	10,025	7,170	3511
4	Ditto. fine bright Coat,	9,560	6,830	3501
5	An <i>East India</i> Diamond, pale blue,	26,485	18,945	3512
6	Ditto. bright yellow	23,33	16,71	3524
7	Ditto. very fine Water, bright Coat,	20,66	14,8	3525
8	Ditto. very bad Water, honeycomb Coat,	20,38	14,59	3519
9	Ditto. very hard bluish Cast,	22,5	16,1	3515
10	Ditto. very soft, good Water,	22,615	16,2	3525
11	Ditto. a large red foul in it.	25,48	18,23	3514
12	Ditto. soft bad Water	29,525	21,140	3521
13	Ditto. soft brown Coat,	26,535	18,99	3516
14	Ditto. very deep green Coat,	25,25	18,08	3521

The mean Specific Gravity of the *Brazil* Diamonds appears to be 3513.

The mean of the *East-India* Diamonds, " " " " " 3519.

The mean of Both to be " " " " " 3517.